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Self-perceived competence and social acceptance of young children who stutter: Initial findings

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Self-perceived competence and social acceptance of young children who stutter: Initial findings

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Abstract

Purpose: The goals of this study were to determine whether young children who stutter (CWS) perceive their own competence and social acceptance differently than young children who do not stutter (CWNS), and to identify the predictors of perceived competence and social acceptance in young speakers.

Method: We administered the *Pictorial Scale of Perceived Competence and Social Acceptance for Young Children* (PSPCSA; Harter & Pike, 1984) to 13 CWS and 14 CWNS and examined group differences. We also collected information on the children's genders, temperaments, stuttering frequencies, language abilities, and phonological skills to identify which of these factors predicted PSPCSA scores.

Results: CWS, as a group, did not differ from CWNS in their perceived general competence or social acceptance. Gender predicted scores of perceived general competence, and stuttering frequency predicted perceived social acceptance. Temperament, language abilities, and phonological skills were not significant predictors of perceived competence or social acceptance in our sample.

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Conclusions: While CWS did not significantly differ from CWNS in terms of perceived competence and social acceptance, when both talker groups were considered together, girls self-reported greater perceived competence than boys. Further, lower stuttering frequency was associated with greater perceived social acceptance. These preliminary findings provide motivation for further empirical study of the psychosocial components of childhood stuttering.

Learning outcomes: Readers will be able to describe the constructs of perceived competence and social acceptance in young children, and whether early stuttering plays a role in the development of these constructs.

Keywords: Perceived competence, Perceived social acceptance, Self-concept, Stuttering, Children

1. Introduction

Our self-perceptions largely rely on the evaluations and attitudes of people who are significant to us. By way of a "social looking glass," we create a sense of ourselves based on how others perceive us (Cooley, 1902). This identity development is inextricably linked to one's success in communication, which may be affected by stuttering (Daniels & Gabel, 2004). Stuttering is a remarkably complex phenomenon that has broadly been understood to be of multifactorial and dynamic onset and development. One component of this multidimensional understanding is the psychosocial involvement of stuttering. Our present understanding of the psychosocial correlates of early stuttering falls short of a complete picture—both in factors that contribute to stuttering's onset and development, and those that develop from experience with stuttering. Particularly, we do not yet understand the developing sense of self in young children who stutter (CWS). How do CWS perceive themselves in domains outside those directly related to communication? To address this gap, we examined two early developing constructs of self-concept known as perceived general competence and perceived social acceptance in four and five-year olds who stutter.

Empirical work in the field of stuttering has yet to address such broad constructs of the self in young children near the onset of stuttering. We are informed by the literature on young children's awareness of stuttering (Ambrose & Yairi, 1994; Boey et al., 2009; Ezrati-Vinacour, Platzky, & Yairi, 2001), their development of negative communicative attitudes as a result of stuttering (Vanryckeghem, Brutten, & Hernandez, 2005), and their temperaments which account for individual

differences in their reactivity and regulation (review in Jones, Choi, Conture, & Walden, 2014). Together, this empirical base illuminates potential connections between perceived competence, perceived social acceptance, and stuttering. We believe that one potential and likely link is that stuttering may set some children up for difficulties with communication and subsequent listener reactions. These early experiences with challenging social interactions, paired with high emotional reactivity and/or low emotional regulation, could prompt young CWS to negatively view their abilities to meet the global demands of their environment.

Young children's limited metacognitive skills inhibit their ability to assess their overall self-concept as a whole, singular construct (Harter, 2003, 1990). In response to this challenge, researchers have developed means of assessing early building blocks of self-concept in young children via domain-specific perceived competencies, such as in physical, cognitive, and social domains. A frequently used assessment tool is the *Pictorial Scale of Perceived Competence and Social Acceptance for Young Children* (PSPCSA; Harter & Pike, 1984). This scale allows us to measure how young children judge their mastery of skills necessary to meet the demands of their environment in specific domains (Klein & Magill-Evans, 1998).

The skills that children learn during childhood, from riding a bicycle to developing speech fluency, involve consistent and constant practice at both overt and subconscious levels. As toddlers mature, they redirect their dependence on their caregivers towards greater independence in self-regulating their attention, emotion, and behaviors (Nelson et al., 2009). This increased self-regulation promotes skill mastery. The quality of self-regulation, and the inherent reactivity that precedes it, is not uniform across children. Troves of empirical evidence point to individual differences that prime children to seek out different experiences and to uniquely make meaning of those experiences. These individual differences are largely attributed to children's temperaments—their unique proclivities in attentional, emotional, and motor reactivity and regulation which make them active agents in their own environments (Rothbart, 2011). Thus, temperament acts a filter through which children's experiences with skill practice and subsequent mastery become individualized. As a result of their increasing skill development, they gain a sense of their competence in

the world—a view that is relatively stable over time and contributes to their emotional, social, and academic development (Verschueren, Buyck, & Marcoen, 2001).

Given children's objective level of skill mastery, their early self-perceptions tend to be unrealistically positive and idealistic, all-or-none (i.e., one is either good at doing things or not), and directly linked to observable behaviors that the child demonstrates (Coplan, Findlay, & Nelson, 2004; Nelson et al., 2009). In most cases, these overly simplistic perspectives are helpful and adaptive in early childhood. Having a heightened sense of self at this critical stage of development can motivate young children to achieve greater levels of mastery and growth in a variety of skill areas (Harter, 1990), and may also serve as a protective buffer between negative life events and mental health (McQuade et al., 2014; Tram & Cole, 2000).

Although it is developmentally appropriate for young children to have an unrealistically positive sense of their own competence, not all children conform to this trend. Some children may perceive their competence realistically or negatively beginning as early as four years of age (Coplan et al., 2004). For these children, their realistic or negative self-perceptions tend to be correlated with a variety of adverse social and behavioral outcomes. For instance, they may demonstrate more non-social behaviors (e.g., reticence, solitary-passive withdrawal, solitary-active behavior; Nelson et al., 2009) and internalizing behaviors (e.g., anxiety, loneliness; Coplan et al., 2004) than children who perceive their competence positively, and are at risk for being excluded by their peers and demonstrating poorer academic achievement (Klaver, Palo, & DiLalla, 2014; Miserandino, 1996; Phillips, 1984). These consequences can impede a child's goal setting, achievement, and fulfillment in life (Hotulainen, Lappaleinen, Ruoho, & Savolainen, 2010).

Studies of typically developing children have revealed constitutional and domain-specific factors that contribute to their perceptions of their own competencies (Jambunathan & Hurlbut, 2000). The constitutional factors that we examined in the present study were gender and temperament. Gender differences in competencies have been accounted for by variations in neural wiring between the sexes (Shaywitz et al., 1995), distinct preferences in activities that lead to differential mastery of those activities (Ruble, Martin, & Berenbaum, 2006; Early et al., 2010), and possibly gender-stereotyped socialization (Wigfield

et al., 1997). Temperament is another constitutional trait that drives individuals to interact differentially and uniquely with their environment. In childhood, temperament is active in developing attentional capabilities and thus motivation, and this motivation is what promotes skill mastery and competence (Rothbart & Hwang, 2005). Children with high self-regulatory abilities tend to have high-quality social interactions, resilience when faced with adversity, and high academic achievement (Eisenberg et al., 1997; Masten & Coatsworth, 1998; Rubin, Coplan, Fox, & Calkins, 1995). Importantly, extant research on the temperament characteristics of CWS have identified that CWS tend to have greater negative affect, differences in attentional processes, and lower adaptability than typically fluent peers (review in Jones et al., 2014). Given that high self-regulatory abilities are associated with high achievement and competence, and that CWS, as a group, tend to demonstrate low self-regulatory abilities, it seems reasonable to speculate that CWS may be at risk for low perceived competence when compared to their typically fluent peers.

In addition to the aforementioned constitutional factors, there are also domain-specific factors that help shape children's developing competencies. In the present study, our domain of interest was communication. As such, we examined whether children's language and speech abilities predicted their self-perceived competence and social acceptance. Fundamentally, language and speech competence is a prerequisite not only for the development of the self, but also for meta-cognitive evaluation of one's abilities and self-perceptions (Hotulainen et al., 2010; Jambunathan & Norris, 2000). Linguistic competence is also a critical component of many cognitive skills such as reading, problem solving, and reasoning, as well as social skills. Children with typically developing language, as compared to children with language impairments, tend to be more well-liked by their peers and demonstrate more prosocial behaviors (Fujiki, Brinton, Morgan, & Hart, 1999; Gertner, Rice, & Hadley, 1994), but this effect does not typically manifest in differential perceived social acceptance until adolescence (Jerome, Fujiki, Brinton, & James, 2002). Regarding speech competence, speakers typically rely on the fluent expression of their thoughts and ideas to communicate with others across a variety of speaking contexts. However, persistent fluency breakdown (i.e., stuttering) can negatively affect how speakers perceive themselves as

communicators. For instance, adolescents who stutter tend to experience greater communication apprehension and have poorer self-perceptions of their communication competence when compared to typically fluent adolescents (Blood & Blood, 2004; Blood, Blood, Tellis, & Gabel, 2001). In the present study, we were interested in determining whether such negative self-perceptions of communication competence extended to younger speakers closer to the onset of stuttering, and more broadly to self-perceptions of general competence and social acceptance.

When our strengths and weaknesses are brought to our attention, we develop an awareness of the ways we are different from others. Children begin to show awareness of stuttering in themselves and others as young as two or three years of age (Ambrose & Yairi, 1994; Boey et al., 2009; Ezrati-Vinacour et al., 2001). Beyond awareness, CWS may develop negative attitudes and beliefs about communication and their social interaction abilities soon after stuttering onset. Preschoolers and kindergarteners who stutter are more likely to adopt negative speech-related attitudes when compared to their typically fluent peers as assessed by the *Communication Attitude Test for Preschool and Kindergarten Children Who Stutter* (KiddyCAT; Clark, Conture, Frankel, & Walden, 2012; Vanryckeghem & Brutten, 2007; Vanryckeghem, Brutten, & Hernandez, 2005). These negative communication attitudes are correlated with increased stuttering frequency, negative emotion, and fears about speaking (Bajaj, Hodson, & Westby, 2005; De Nil & Brutten, 1991; Vanryckeghem & Brutten, 1996; Vanryckeghem, Hylebos, Brutten, & Peleman, 2001), all of which could potentially lead to and/or be perpetuated by negative self-perceptions.

Not only are children capable of experiencing internal reactions to stuttering, they may be at risk for experiencing external reactions to their stuttering from their listeners. For example, Langevin, Packman, and Onslow (2009) observed preschoolers who stutter in naturalistic playground interactions and found that some of their peers reacted negatively to their stuttering by demonstrating confusion, walking away, interrupting, or teasing. In addition to the negative peer reactions, these preschoolers who stutter demonstrated difficulty leading peers in play, participating in pretend play, and resolving conflicts (Langevin et al., 2009). These findings speak to the social difficulties that some preschoolers who stutter may encounter. Repeated exposure to such difficulty in communication can have deep-rooted

social-emotional repercussions, which may influence a child's developing sense of self-concept.

Taken together, the purpose of the present study was to provide preliminary insight into the relationship between early stuttering and the development of self-concept. To examine this, we utilized the *Pictorial Scale of Perceived Competence and Social Acceptance* (Harter & Pike, 1984) as an instrument to investigate two early-developing constructs of self-concept – perceived competence and perceived social acceptance – in a sample of four and five-year olds who do and do not stutter. We posed two research questions to address our purpose:

1. Do young CWS differ from children who do not stutter (CWNS) in their perceived general competence and/or social acceptance? We hypothesized that CWS would score lower than CWNS on both perceived general competence and perceived social acceptance.

2. Which individual characteristics predict how children perceive their general competence and social acceptance? We hypothesized that both constitutional and communication-related factors would predict children's perceived general competence and social acceptance. The constitutional factors we included in our analyses were gender and temperament. The communication-specific factors we included were stuttering frequency, language abilities, and phonological skills.

2. Methods

This present quasi-experimental study represents a cross-sectional subset of data previously collected for a multi-site longitudinal study of developmental stuttering conducted at the University of Illinois, University of Iowa, and University of Wisconsin at Milwaukee and directed by investigators at the University of Illinois (E. Yairi and N. Ambrose, RO1-DC05210). In the original longitudinal study, participants' first data were collected within 12 months of reported stuttering onset, six months after that initial visit, and then once a year for five years, for a total of seven visits. The study procedures were approved by the University of Iowa Institutional Review Board.

2.1. Participants

Twenty-eight young children were included in the present study, including 18 boys and 10 girls. The experimental group consisted of 14 CWS with a mean age of 58.57 months (range = 49–70, SD = 6.24), including 10 boys and 4 girls. The control group consisted of 14 CWNS with a mean age of 56.86 months (range = 48–68, SD = 5.22), including 8 boys and 6 girls. All participants were Caucasian, native English speakers with no history of neurological, hearing, or intellectual problems. The inclusionary criteria for the experimental group, which were adapted from Yairi and Ambrose (1999), included: (1) being regarded by their parent(s) and two investigators as having a stuttering problem, and (2) demonstrating at least 3% stuttering-like disfluencies (SLDs) in 300 words of spontaneous speech (SLDs include sound/syllable repetitions, monosyllabic word repetitions, audible sound prolongations, and inaudible sound prolongations). Inclusionary criteria for the control group included: (1) being regarded by their parent(s) and two investigators as not having a stuttering problem, and (2) demonstrating less than 3% SLDs in 300 words of spontaneous speech. The participants included in the present study were selected from the larger pool of participants because (a) they had completed the PSPCSA within the normative age range for this measure (4–7 years old) and (b) of adherence to participant-matching protocol. Participants in the present study were recruited via advertisements in local newspapers and referrals from speech-language pathologists throughout Iowa. All parents provided informed consent, and all children provided verbal assent to participate in the study.

The Shapiro-Wilks Normality Test indicated that the distribution of general competence scores was not normal within our sample, $W = 0.93(28)$, $p = 0.05$, and identified one outlier (S2). Once this participant was removed from the dataset, the normality assumption was subsequently upheld, $W = 0.96(27)$, $p = 0.41$. Thus, the final dataset included 13 CWS (9 boys; mean age = 59.15 months, SD = 6.27) and 14 CWNS (8 boys; mean age = 56.86, SD = 5.22). See **Table 1** for participant characteristics.

Table 1 Individual characteristics of CWS (n = 14) and CWNS (n = 14).

CWS						CWNS					
ID	*Gender*	*Age (mo)*	*%SLD*[a]	*Gen Comp*[b]	*Soc Accept*[c]	*ID*	*Gender*	*Age (mo)*	*%SLD*[a]	*Gen Comp*[b]	*Soc Accept*[c]
E1	M	49	5.33	3.09	3.00	C1	M	48	–	3.50	2.75
E2[d]	M	52	4.00	2.54	2.02	C2	M	52	1.00	3.17	3.50
E3	M	53	3.00	2.92	3.25	C3	M	53	1.33	2.67	3.00
E4	M	54	6.67	3.25	2.75	C4	F	52	1.67	3.75	3.33
E5	M	55	3.00	3.50	2.83	C5	M	54	2.67	3.50	2.84
E6	F	56	4.67	3.50	2.42	C6	F	55	1.11	3.33	3.67
E7	F	56	–	3.67	3.92	C7	M	56	0.67	2.84	3.75
E8	F	57	–	3.00	3.58	C8	F	55	2.00	3.84	3.08
E9	M	59	5.33	2.92	3.17	C9	M	60	1.07	3.42	3.25
E10	F	63	4.33	4.00	4.00	C10	F	62	1.33	4.00	2.67
E11	M	64	3.33	4.00	2.34	C11	F	60	0.33	3.67	3.50
E12	M	65	–	3.67	3.42	C12	F	60	–	3.67	2.84
E13	M	67	4.00	3.34	2.92	C13	M	61	2.00	3.67	3.83
E14	M	70	6.00	3.58	2.67	C14	M	68	2.33	3.25	3.34
Mean		**59.15**	**4.57**	**3.26**	**3.10**	**Mean**		**56.86**	**1.46**	**3.45**	**3.24**
SD		**6.27**	**1.27**	**0.50**	**0.52**	**SD**		**5.22**	**0.70**	**0.37**	**0.38**

The left side of the table represents data from the experimental group (CWS), and the right side represents the control group (CWNS).

a. Percentage of stuttering-like disfluencies in a 300-word spontaneous speech sample with mother.

b. General Competence (average of cognitive competence and physical competence); higher value indicates greater competence.

c. Social Acceptance (average of peer acceptance and maternal acceptance); higher value indicates greater acceptance.

d. E2 was an outlier; he was removed from the analyzed dataset.

2.2. Procedures

Participants were tested in a laboratory setting specifically designed for testing young children, with the data collection session lasting approximately two hours. The beginning of each session began with a parent interview to collect pertinent history while the child engaged in individual free play in the same room. After the parent interview, the parent was asked to play with her/his child for 15–20 min as they would at home. This spontaneous parent-child conversational interaction was recorded for later analysis. After the parent-child interaction, the child completed the standardized measures with a trained research associate. During this time, the parent(s) completed the parent-report

measures in a different room. All assessments were scored after the child's visit using standardized procedures and norms provided by the respective assessment manuals.

2.3. Measures

2.3.1. Perceived competence and social acceptance

Each participant completed the *Pictorial Scale of Perceived Competence and Social Acceptance for Young Children* (PSPCSA; Harter & Pike, 1984). The PSPCSA is divided into four subscales: cognitive competence, physical competence, peer acceptance, and maternal acceptance. The first two subscales are averaged to obtain a composite for perceived general competence, and the latter two subscales are averaged to obtain a composite for perceived social acceptance. These two composites served as the dependent variables in the present study. The PSPCSA is intended to measure these two constructs separately rather than provide a singular assessment of global self-concept or self-esteem (Harter & Pike, 1984).

Harter and Pike (1984) created two versions of the PSPCSA—one for preschoolers and kindergarteners, and another for first and second graders. The former scale was utilized in the present study because the ages of the participants aligned with those of the normative population. For the preschool and kindergarten scale, the normative population included 146 children–90 preschoolers (mean age = 4.45 years) and 56 kindergarteners (mean age = 5.54 years). The authors reported that the gender distribution was about even. Ninety-six percent of the children in the normative population were Caucasian, and the remaining 4% were Hispanic, African American, or Asian. Internal consistency reliability for the general competence subscale was $a = 0.76$ (acceptable), $a = 0.87$ for social acceptance (good), and $a = 0.88$ for the total scale (good). Intercorrelations among general competence and social acceptance subscales ranged from $r(88) = 0.43–0.64$, $p < 0.001$ for the preschoolers, and $r(54) = 0.27–0.62$, $p < 0.025$ for the kindergarteners.

The PSPCSA contains 24 picture plates that were presented to the child, with six items per subscale (see Appendix A). Each picture plate showed two Pictures—one of a gender-matched child being successful at an activity, and the other of the same child being unsuccessful

at that same activity. The participant was asked to indicate which child he/she was most like. Once the child made a choice, the child was then asked if he/she was "a little bit like that child" or "a lot like that child." Each item was scored on a 4-point scale, where 1 indicated the child felt least competent/accepted, and 4 indicated the child felt most competent/accepted. Item scores were then averaged across the six items for each subscale so that a value between 1 and 4 was assigned for cognitive competence, physical competence, peer acceptance, and maternal acceptance. To generate a score for the construct of perceived general competence, the scores for the cognitive competence and physical competence subscales were averaged. Similarly, to obtain a score for perceived social acceptance, the scores for the peer acceptance and maternal acceptance subscales were averaged (Harter & Pike, 1984).

2.3.2 Temperament

Each participant's mother completed the *Children's Behavioral Questionnaire—Short Form* (CBQ-SF; Putnam & Rothbart, 2006). On this standardized measure of temperament for children between three and eight-years old, mothers rated how true each of the 94 statements was for their child on a 7-point Likert scale, where 1 indicated "extremely untrue of your child" and 7 indicated "extremely true of your child." Maternal responses to these questions were used to measure 15 different scales (e.g., activity level, impulsivity). These scales were then subjected to factor analysis and yielded three broad factors: surgency, negative affect, and effortful control. Surgency is the tendency for the child to present with a great overall energy level. Negative affect is the likelihood that the child will react to situations with negative emotional states. Effortful control is the efficiency of executive attention, including the child's ability to inhibit a dominant response and/or activate a subdominant response, plan, and detect errors. A value between 1 and 7 was calculated for each of these three temperament characteristics for each child.

2.3.3 Stuttering frequency

To obtain a recording of the child's speech to analyze for stuttering frequency, each child engaged in a 15 to 20-min conversation with his/her parent using toys and child-centered materials (e.g., Play-Doh) at

a child-sized table. Parents were instructed to play with their child as they would at home. This parent-child interaction was audio recorded using a lapel microphone (Shure MX183BP) that was placed approximately 20 cm from the child's lips, and a tabletop microphone (Shure MX3930) that was placed on the table close to the child. The first author listened to these recordings and analyzed the first 300 words of intelligible speech produced by the child. Stuttering frequency was calculated for each participant by dividing the number of stuttering-like disfluencies (SLDs; i.e., sound/syllable repetition, monosyllabic whole-word repetition, audible sound prolongation, inaudible sound prolongation) by the total number of words in the sample (300). For a variety of technical reasons, recordings of speech samples were unavailable for six participants.

2.3.4 Language

A single composite rating for language skill was calculated by averaging standardized scores of receptive language and expressive language. Each participant's standard scores on the *Peabody Picture Vocabulary Test—Third Edition* (PPVT-III; Dunn & Dunn, 1997), *Expressive Vocabulary Test* (EVT; Williams, 1997), and spoken language quotient of the *Test of Early Language Development—Third Edition* (TELD-3; Hresso, Reid, & Hammill, 1999) were standardized and then averaged to compute one composite score of language ability. Values of zero indicated the mean, with scores above zero indicated language aptitude better than average for the child's age, and scores below zero indicated language abilities lower than average for the child's age.

2.3.5. Phonology

To obtain a measure of phonological ability, participants completed the *Hodson Assessment of Phonological Patterns—Third Edition* (HAPP-3; Hodson, 2004). Ability scores were standardized such that zero was the mean, scores above zero indicated phonological abilities better than average for the child's age, and scores below zero indicated phonological abilities lower than average for the child's age. Data were missing from three participants due to non-compliance during the task.

2.4. Multicollinearity of variables

We considered the multicollinearity among the predictor variables we would input in the regression model (i.e., gender, surgency, negative affect, effortful control, stuttering frequency, language, phonology). The variance inflation factors (VIF) among these variables ranged from 1.10 to 1.65. Values greater than 5 would indicate a multicollinearity problem. Hence, we identified no cause for concern regarding excessive correlation among our predictor variables.

2.5. Data analyses

2.5.1 Between-group differences in PSPCSA scores

To test our first hypothesis that CWS would score lower than CWNS on the PSPCSA, we conducted independent samples *t*-tests on each of the PSPCSA composites (i.e., general competence, social acceptance) as well as the four subscales (i.e., cognitive competence, physical competence, peer acceptance, maternal acceptance).

2.5.2 Predictors of general competence and social acceptance

To test our second hypothesis that children's constitutional and communication-specific factors would predict their scores of perceived general competence and social acceptance, we collapsed the participants into one group and then implemented Akaike's Information Criterion (AIC), a goodness-of-fit procedure, on the entire dataset. The purpose of pooling all the participants into one group for these analyses was to determine the differential effects of stuttering frequency across all children, regardless of talker group membership, when stuttering frequency acted as a proxy for talker group membership. AIC is a statistical method that determines the best predictors in explaining the variability in the data. The criterion uses the fit of the data as a base for the statistic, but penalizes the fit for each parameter estimated in the model; that is, more parameters in the model may equals a larger penalty, but perhaps a better fit. This helps determine the parameters that fit the data well, without including unnecessary information in the model. The predictors included in the AIC analysis were gender, temperament (i.e., surgency, negative affect, effortful control), stuttering frequency, language, and phonology. Once the AIC model

selected the meaningful predictor(s) out of the seven possible predictors, those chosen predictors were then fit with a linear regression in order to determine the degree to which they predicted perceived general competence and perceived social acceptance scores.

2.5.3. Missing data

AIC requires analyses be performed on a complete dataset of predictor variables. Out of the 27 participants, 19 participants had a complete dataset. If we were to use traditional statistical approaches, all data for those eight participants with missing data would be removed and thus only 70% of the data would be analyzed. This listwise deletion introduces biased results with inaccurate error estimates (Rubin, 1976) and thus raises several concerns for drawing meaningful conclusions about the data. There are various methods to handle missing data, but a leading and recommended statistical method is *multiple imputation*. Multiple imputation generates at least five new datasets where the missing values are imputed based on the observed relationships between the other values in the complete dataset. If an independent variable is chosen by at least 50% of the five imputed datasets (at least three AIC analyses), then that variable is used in the final regression analysis (Wood, White, & Royston, 2008). See Appendix B for further discussion of multiple imputation.

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regression analysis (Wood, White, & Royston, 2008). See Appendix B for further discussion of multiple imputation.

3. Results

3.1. Between-group differences in PSPCSA scores

As a group, CWS did not score significantly differently than CWNS on perceived general competence, $t(25) = 0.20$, $p = 0.84$, or perceived social acceptance, $t(25) = 0.81$, $p = 0.43$. Further, there were no between-group differences on any of the four PSPCSA subscales: cognitive competence, $t(25) = 1.16$, $p = 0.26$; physical competence, $t(25) = 0.48$, $p = 0.63$; peer acceptance, $t(25) = 0.46$, $p = 0.65$; maternal acceptance, $t(25) = 1.04$, $p = 0.31$. This finding did not support our a priori hypothesis that CWS would score lower than CWNS on their perceptions of general competence and social acceptance. Descriptively, the data for both talker groups (i.e., CWS and CWNS) were skewed in the direction of positive judgments (**Fig. 1**).

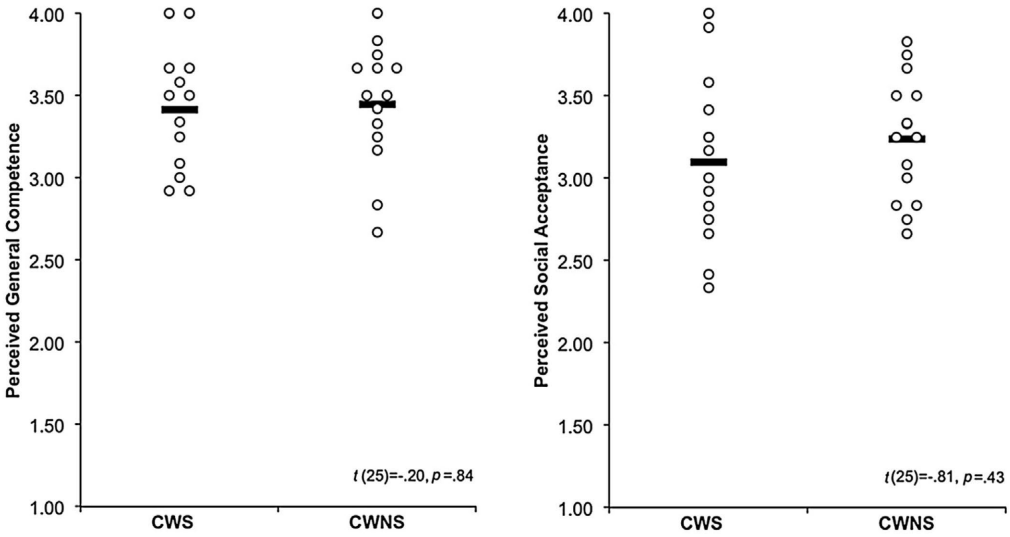

Fig. 1. PSPCSA composite scores by group. These univariate scatterplots represent the distributional information of the PSPCSA data across groups. The left graph represents data of perceived general competence, and the right graph represents data from perceived social acceptance. The white dots represent each child's individual score, and the short black bars represent the group means.

3.2. Predictor of perceived general competence

When all the participants were pooled, AIC selected only gender to best predict perceived general competence for four of the five imputed datasets. For one of the five imputed datasets, AIC chose gender, stuttering frequency, language, and phonology. Using our requirement of a predictor being chosen in at least three imputed datasets, gender was the only variable that was used in the final regression model. Temperament, stuttering frequency, language, and phonology were not selected by AIC as potentially meaningful predictors, so they were not included in the regression model. A linear regression was fit predicting perceived general competence by gender, and the model identified gender as a significant predictor of general competence that accounted for 19.9% of the variability in perceived general competence scores, $F(1, 25) = 6.22$, $p = 0.02$ (**Fig. 2**). On average, girls had higher perceived general competence scores as compared to boys (3.64, 3.31, respectively, on a 4-point scale). This finding partially supported our a

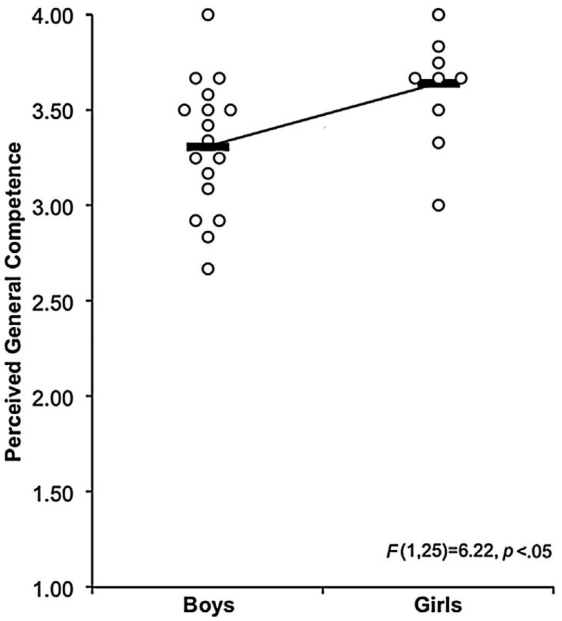

Fig. 2. Gender as a predictor of perceived general competence. This univariate scatterplot represents the distributional information of individual boys' and girls' scores (white dots) and the means of the perceived general competence scores by gender (short black bars). The diagonal line represents the regression analysis which indicates the degree of variability in perceived general competence attributed to gender (i.e., boys vs. girls).

priori hypothesis that constitutional and domain specific factors would predict children's perceived general competence.

Based on the gender effect for perceived general competence, we took an ancillary look into other potential gender differences in our sample. First, we examined the specifics of the gender effect for perceived general competence to discern whether the gender effect applied to perceived cognitive competence, perceived physical competence, or both of these subscales that comprise perceived general competence. Girls rated their cognitive competence significantly higher than boys did, $t(25) = 2.81$, $p = 0.009$, $d = 1.21$ (large effect), but this gender effect was not significant for physical competence, $t(25) = 1.62$, $p = 0.12$. Descriptively, girls rated their cognitive competence higher than boys did (3.80, 3.43, respectively), and they also rated their physical competence higher than boys did (3.48, 3.17, respectively). Second, we were interested in identifying whether there were any other gender dichotomies for the other variables in our dataset (i.e., temperament [surgency, negative affect, effortful control], stuttering frequency, language, phonology) that might have contributed to the gender effect for perceived general competence. The only variable that approached significance was effortful control, $t(25) = 1.87$, $p = 0.07$. Girls trended towards higher effortful control than boys with an average of 5.60, compared to the boys' average of 5.10, on a 7-point scale.

3.3. Predictor of perceived social acceptance

When all the participants were pooled, AIC identified stuttering frequency, language, and phonology as best predicting perceived social acceptance for all five of the imputed datasets. This met our requirement for the inclusion of the parameters and all three were used in the final regression model. Gender and temperament were not selected by AIC as potentially meaningful predictors, so they were not included in the regression model. A linear regression was fit for stuttering frequency, language, and phonology. The results indicated that stuttering frequency was the only significant predictor of social acceptance, $F(3, 23) = 9.06$, $p = 0.003$, and accounted for 20.0% of the variability in perceived social acceptance scores. As stuttering frequency increased, perceived social acceptance scores

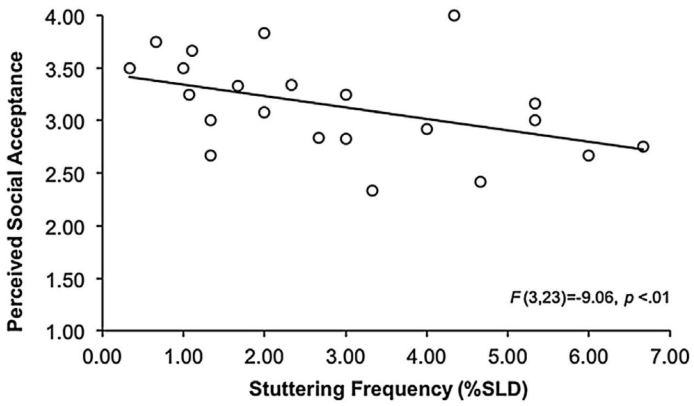

Fig. 3. Stuttering frequency as a predictor of perceived social acceptance. This univariate scatterplot represents the distributional information of stuttering frequency by perceived social acceptance across all participants. The white dots represent individual participants' data points (some missing due to missing data), and the black trend line represents the regression analysis which indicates the degree of variability in perceived social acceptance attributed to stuttering frequency (percentage of stuttering-like disfluencies).

decreased (**Fig. 3**). Language was marginally significant, F (3, 23) = 3.39, p = 0.07, and phonology trended towards significance, F(3, 23) = 2.82, p = 0.10. This finding partially supported our a priori hypothesis that constitutional and communication-related skills including stuttering frequency, language abilities, and phonological abilities would predict children's perceived social acceptance.

4. Discussion

4.1. Summary of main findings

This study yielded three main findings. First, CWS, as a group, did not score lower than CWNS on perceived general competence or social acceptance, or any of the subscales that make up those global constructs. Second, gender was the only significant constitutional or communication-specific predictor of perceived general competence, and accounted for 19.9% of the variance in perceived general competence scores. Third, stuttering frequency was the only significant constitutional or communication-specific predictor of perceived social

acceptance, and accounted for 20.0% of the variance in perceived social acceptance. Implications of these results follow.

4.2. CWS and CWNS perceived competence and social acceptance similarly

We hypothesized that CWS would score lower than CWNS on their self-perceptions of general competence and social acceptance, but the results did not support this hypothesis. As a group, CWS were not more likely to have lower perceived general competence or social acceptance than CWNS. We can therefore infer that simply being a CWS does not inherently put a young child at risk for developing poor self-perceptions of his/her general and interpersonal competence. These null findings may be explained, in part, by factors related to the sampling pool, statistical power, and/or the age and developmental skill levels of the children in this study (i.e., young children's self-perceptions are typically unrealistically positive; Harter & Pike, 1984). However, it should be noted that the lack of between-group differences does not necessarily mean that there were no real differences between children in this study, which will be discussed in the following sections.

4.3. Gender predicted perceived general competence

When we pooled the participants together, we hypothesized that children's constitutional and communication-specific characteristics would predict their perceived general competence ratings. The constitutional factors we included were gender and temperament, and the communication-specific factors were stuttering frequency, language abilities, and phonological skills. Our results partially confirmed this hypothesis, as the constitutional factor of gender predicted children's judgment of their general competence. The girls in our study scored an average of 0.33 points higher on self-perceived general competence than boys. This prompted the follow-up question of whether girls scored higher on one or both of the subscales that make up the construct of general competence—perceived cognitive competence or perceived physical competence. Our ancillary findings revealed that girls' advantage over boys in perceived general competence was likely

attributed to their significantly higher ratings of cognitive competence, not physical competence.

4.3.1. Gene X environment interactions and the female advantage

At first, this gender effect on perceived competence (specifically, perceived cognitive competence) was a somewhat unanticipated result given previous studies that report no gender differences on mean subscale scores of the PSPCSA (Adams & Anderson, 1985; Harter & Pike, 1984; Jambunathan & Hurlbut, 2000; Mantzicopoulos, 2006; Strein, Simonson, & Vail, 1999). If there truly are no gender differences in perceived competence within the general population of young children, then our results may reflect sampling error that resulted in a group of ten girls who were either more competent or perceived themselves as more competent when compared to the boys. However, there are several lines of research, within the field of developmental stuttering included, that point to gender effects in a slew of biological and experiential factors that might account for actual differences in competence across genders.

A look into the gender effect on competence points to likely gene x environment interactions. From very early in life, boys and girls tend to show distinct, gender-stereotyped preferences for activities. For instance, boys tend to demonstrate greater interest in gross motor activities, blocks, sports, and action figures, while girls tend to show greater interest in fine motor tasks and activities involving verbal mediation (Ruble et al., 2006). These behavioral proclivities can influence the activities that boys and girls select to engage with, making them active agents in their own development. Girls, as compared to boys, tend to spend more free choice time in language and literacy activities, art, and fine motor tasks, and less free choice time in science, social studies, and gross motor activities as compared to boys (Early et al., 2010). These innate preferences may promote girls' greater exposure to experiences that promote school readiness skills. The PSPCSA items that girls rated themselves significantly higher than boys did in our study related to cognitive competence which included skills such as, "good at puzzles," "gets stars on papers," "knows names of colors," "good at counting," "knows alphabet," and "knows first letter of name." These cognitive skills are related to being a "good student" and competence in language-related

tasks. That girls participate more in these cognitively stimulating tasks may promote greater levels of mastery in these academic skill areas, and thus it may be that they really are more competent than boys in this domain. This gender gap in academic achievement continues into the school years and adulthood, with a female advantage for reading and writing (Scheiber, Reynolds, Hajovsky, & Kaufman, 2015; Stoet & Geary, 2015).

Other important gender differences in childhood point to a female advantage for self-regulation (i.e., greater effortful control; Kochanska, Murray, & Harlan, 2000; Murphy, Eisenberg, Fabes, Shepard, & Guthrie, 1999; Raffaelli, Crockett, & Shen, 2005), lower autonomic arousal during complex language tasks (Arnold, MacPherson, & Smith, 2014), greater functional cortical connectivity in auditory-motor regions (Chang & Zhu, 2013), stronger phonological and orthographic abilities (Berninger, Nielsen, Abbott, Wijsman, & Rasking, 2008), greater attentional flexibility, and a greater balance between speech and language abilities (less speech-language dissociations; Clark et al., 2012). Further, girls have been shown to possess faster processing speeds, which tend to be predictive of writing and verbal skills (Camarata & Woodcock, 2006; Floyd, McGrew, & Evans, 2008). From an experiential perspective, girls are more likely to be socialized to value interpersonal relationships and verbal skills than boys, and thus rate their competence higher than boys do in these domains (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield et al., 1997). One aspect of female-stereotyped interpersonal behavior is affiliation (i.e., warmth, responsiveness, support; Leaper, 2000). Affiliation has been positively linked to higher perceived cognitive competence in young girls (Cramer & Skidd, 1992); if young girls think they are following social rules through use of female-stereotyped behavior, then they may believe they are portraying their "best selves" and thus have a strong sense of self-worth. Taken together, these biological and environmental factors likely interact to promote greater communication facility among girls as compared to boys, and thus girls may have or seek out more opportunities and experiences to communicate with others. Because communication and cognition are so closely linked, strong communicative abilities might translate to greater global cognitive competence.

4.3.2. Stuttering and the female advantage

Although the abovementioned studies represent cross-sectional datasets, we might speculate that these female advantages, apparent from an early age, could potentially protect girls from persistent stuttering. Girls are less likely to begin stuttering than boys, and girls who do begin to stutter are more likely to experience unassisted recovery and experience it sooner than boys (Yairi & Ambrose, 1999). According to our sample, girls (regardless of talker group membership) tended to perceive their competence higher than boys who do and do not stutter. Because of our small sample size and methodology, we cannot draw conclusions about the specific protective factors that being a girl lends to the trajectory of stuttering. However, since we know that perceived competence can mediate a child's environment or life events and his/her psycho affective development (Tram & Cole, 2000), we might conjecture that girls' very positive perceptions of their competence may serve as one of the buffers against stuttering. Future work could take a longitudinal approach to investigating this hypothesis by recruiting boys and girls near the onset of stuttering and tracking how their perceived competence predicts stuttering persistence and recovery across development.

4.4. Stuttering frequency predicted perceived social acceptance

We hypothesized that, when we collapsed the participants into one group, constitutional and communication-specific factors would predict children's perceived social acceptance ratings. The constitutional factors we included were gender and temperament, and the communication-specific factors were stuttering frequency, language abilities, and phonological skills. Our results partially confirmed this hypothesis, as the communication-specific factor of stuttering frequency predicted children's judgment of their social acceptance. There was a negative relationship between stuttering frequency and perceived social acceptance; higher frequency of SLDs predicted lower perceptions of social acceptance, while lower frequency of SLDs predicted higher perceptions of social acceptance.

4.4.1. Directionality of effect

The finding indicates that stuttering is a likely factor in children's developing perceptions of social acceptance. However, it does not

elucidate the directionality of this effect; in other words, we cannot state, with certainty, whether low perceived social acceptance leads to increased stuttering, or whether greater experience with stuttering leads to low perceived social acceptance in young children. The former alternative seems fairly unreasonable; we would not expect that early in childhood, how well a child feels accepted by his peers and family would directly influence how frequently he stutters. Rather, we might presume that the latter is a more viable alternative. For instance, the literature that reveals CWS are at risk for developing negative attitudes towards communication (Vanryckeghem, Brutten, & Hernandez, 2005) and experiencing negative peer reactions in response to their stuttering (Langevin et al., 2009) might speak to how their experiences with stuttering affect their psychosocial development. Equipped with this empirical base, we side with notion that stuttering experience may lead to poorer perceived social acceptance (Zebrowski, 2007).

4.4.2. Stuttering experience

One might argue that stuttering frequency does not wholly encapsulate a child's experience with stuttering, and that other qualities of the child's stuttering history should be considered, such as how long the child has been stuttering for. At the time of data collection, the CWS in our sample had been stuttering for a range of 15–41 months, which is a non-negligible time-since-onset when considering how young these children were. The fact that all children in our sample had been stuttering for over a year speaks to their notable experience with stuttering. There are two important caveats to note here. First, we do not know how many of the children in our sample recovered from stuttering due to the cross-sectional nature of this dataset. Theoretically, about 80% of the children will have recovered (Yairi & Ambrose, 2005). Second, majority of the children in this study demonstrated mild or mild-moderate stuttering—between 3% and 6.67% SLDs in a 300-word conversational sample. This skewed data, although a typical representation of young children's stuttering frequency (Tumanova, Conture, Lambert, & Walden, 2014), might reduce the possibility of truly testing the notion that increased experience with stuttering is associated with negative perceived social acceptance.

4.4.3. Social-emotional development of CWS

The finding that higher stuttering frequency was linked to lower perceived social acceptance has at least two critical implications for the social-emotional development of children who stutter.

First, a bidirectional relationship likely exists between perceived competence and social acceptance (Nelson, Rubin, & Fox, 2005). Although these two domains can be assessed differentially in children, they do not develop independently of each other. Higher stuttering frequency may affect children's perceived social acceptance during the preschool/kindergarten years, but those children who persist in stuttering may subsequently develop lower perceptions of their general competence once they reach elementary school and beyond.

Second, low self-perceived social acceptance has been linked to social anxiety in older children (Epkins & Seegan, 2014; Festa & Ginsburg, 2011), adolescents (Grillis-Taquechei, Norton, & Ollendick, 2010; Teachman & Allen, 2007), and adults (Uhrlass, Schofield, Coles, & Gibb, 2009) in cross-sectional datasets. Since the typical age of onset for social anxiety is early adolescence (Haller, Cohen Kadosh, & Lau, 2014), it may not be feasible to directly link perceived social acceptance to social anxiety in preschoolers/kindergarteners. And to the best of our knowledge, a longitudinal, predictive relationship between perceived social acceptance during the preschool/kindergarten years and social anxiety in adolescence does not yet exist. Drawing upon cognitive and interpersonal theories of social anxiety, negative self-perceptions are thought to contribute to the etiology and maintenance of social anxiety. Individuals with social anxiety "are uniquely and primarily concerned about characteristics of the self that they perceive as being deficient or contrary to perceived societal expectations or norms" (Moscovitch, 2009, p. 125). Coupled with the awareness of their speaking difference, negative communication attitudes, and challenging peer reactions to stuttering, we could speculate that young children who stutter more frequently might be particularly primed to perceive their social self-efficacy and social acceptance more poorly than children who are more fluent. However, in our present study, we propose this opinion with caution because our sample undoubtedly includes a mix of children who will and will not persist in stuttering. Therefore, it would be unwise to draw definitive implications about the predictive effects of low perceived social competence

during early childhood and later developing social anxiety. To address this important relationship, future work could assess the perceived social acceptance of young CWS, track their recovery from or persistence in stuttering, and map these qualities onto their potential development of social anxiety in adolescence; this would help elucidate the mechanism underlying the development of social anxiety in individuals who stutter which, in turn, could inform the development of prevention and intervention efforts.

5. Conclusions

In this study, we investigated the extent to which stuttering affects young children's perceptions of their self-concept in the global domains of perceived general competence and social acceptance. As a group, CWS did not significantly differ from CWNS in how they perceived their own competence and social acceptance. When both talker groups were considered together, there was a female advantage for self-perceived competence as girls reported greater self-perceived competence than boys. Further, there was a fluency advantage for self-perceived social acceptance as children who produced fewer stuttering-like disfluencies reported greater self-perceived social acceptance than children who stuttered more frequently. These preliminary findings provide motivation for further empirical study of individual differences related to psychosocial factors of childhood stuttering.

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Appendix A.

Items on the PSPCSA (Preschool-Kindergarten Form)

Perceived General Competence		*Perceived Social Acceptance*	
Cognitive competence	*Physical competence*	*Peer acceptance*	*Maternal acceptance*
Good at puzzles	Good at swinging	Has lots of friends	Mom smiles
Gets stars on papers	Good at climbing	Stays overnight at friends'	Mom takes you places you like
Knows names of colors	Can tie shoes	Has friends to play with	Mom cooks favorite foods
Good at counting	Good at skipping	Has friends on playground	Mom reads to you
Knows alphabet	Good at running	Gets asked to play with others	Mom plays with you
Knows first letter of name	Good at hopping	Eats dinner at friends' house	Mom talks to you

Appendix B.

Multiple Imputation as a method of handling missing data

Multiple Imputation (MI) is a relatively new technique in social science fields, but it is a recommended procedure in handling missing data (Schlomer, Bauman, & Card, 2010; Jelicîc', Phelps, & Lerner, 2009). MI generates many datasets where the missing values are imputed based on the observed relationships between in the complete dataset. The new datasets contain the observed data and statistically probable values in the missing locations. Analyses are performed separately on the imputed datasets and the parameter estimates of the coefficients are combined for an overall univariate effect.

To determine how many datasets should be imputed, the general rule of thumb is that more imputed datasets betters the statistical estimates and standard errors. It is recommended to impute at least five datasets, depending on the amount of missingness. In our dataset, we had a relatively low amount of missingness; we were only missing eight data points out of a possible 243 (9 variables × 27 participants). Therefore, five imputed datasets were sufficient in describing the data. MI was performed in PROC MI (SAS 9.4) using the seven independent variables (i.e., gender, surgency, negative affect, effortful control, stuttering frequency, language, phonology) and two dependent variables (i.e., perceived general competence, perceived social acceptance). The parameter estimates were combined using PROC MIANALYZE in SAS 9.4. In our five imputed datasets, we performed five AIC procedures. If an independent variable was chosen by at least 50% of the datasets (at least three AIC analyses), then that variable was used in the final regression analysis.

Continuing Education Questions:

1. Young children typically perceive their competence
   a. Negatively
   b. Neutrally
   c. Positively
   d. Realistically

2. An example of a constitutional factor is one's .
   a. language ability
   b. Reading level
   c. Temperament
   d. Physical ability

3. Adolescents who stutter tend to …
   a. perceive their communication competence more poorly than their typically fluent peers
   b. perceive their communication competence similarly to their typically fluent peers
   c. experience greater communication apprehension than their typically fluent peers
   d. a & c
   e. b & c

4. The results of this study indicated that stuttering frequency
   a. predicted how children perceived their cognitive competence
   b. predicted how children perceived their social acceptance
   c. predicted how children perceived their physical competence
   d. none of the above

5. Low perceived social acceptance has been linked to
   a. social anxiety
   b. Depression
   c. Unemployment
   d. intellectual disability

References

Adams, P. J., & Anderson, P. L. (1985). The relationship of five-year-olds' academic readiness and perceptions of competence and acceptance. *The Journal of Educational Research*, *79*(2), 114–118.

Ambrose, N. G., & Yairi, E. (1994). The development of awareness of stuttering in preschool children. *Journal of Fluency Disorders*, *19*, 229–245.

Bajaj, A., Hodson, B., & Westby, C. (2005). Communicative ability conception among children who stutter and their fluent peers: A qualitative exploration? *Journal of Fluency Disorders*, *30*(1), 41–64.

Berninger, V. W., Nielsen, K. H., Abbott, R. D., Wijsman, E., & Rasking, W. (2008). Gender differences in severity of writing and reading disabilities. *Journal of School Psychology*, *46*, 151–172.

Blood, G. W., & Blood, I. M. (2004). Bullying in adolescents who stutter: Communicative competence and self-esteem. *Contemporary Issues in Communication Science and Disorders*, *31*, 69–79.

Blood, G. W., Blood, I. M., Tellis, G. M., & Gabel, R. M. (2001). Communication apprehension and self-perceived communication competence in adolescents who stutter. *Journal of Fluency Disorders*, *26*(3), 161–178.

Boey, R. A., Van de Heynig, P. H., Wuyts, F. L., Heylen, L., Stoop, R., & De Bodt, M. S. (2009). Awareness and reactions of young stuttering children aged 2–7 years old towards their speech disfluency. *Journal of Communication Disorders*, *42*, 334–346.

Camarata, S., & Woodcock, R. (2006). Gender differences in processing speed: Developmental effects in males and females. *Intelligence, 34*, 231–252. Clark, C. E., Conture, E. G., Frankel, C. B., & Walden, T. A. (2012). Communicative and psychological dimensions of the KiddyCAT. *Journal of Communication Disorders, 45*, 223–234.

Cooley, C. H. (1902). *Human nature and the social order*, Rev. ed. New York: Scribner's.

Coplan, R. J., Findlay, L. C., & Nelson, L. J. (2004). Characteristics of preschoolers with lower perceived competence? *Journal of Abnormal Child Psychology*, *32*(4), 399–409.

Cramer, P., & Skidd, J. E. (1992). Correlates of self-worth in preschoolers: The role of gender-stereotyped styles of behavior? *Gender Roles*, *26*(9), 369–390.

Daniels, D. E., & Gabel, R. M. (2004). The impact of stuttering on identify construction? *Topics in Language Disorders*, *24*(3), 200–215.

De Nil, L. F., & Brutten, G. J. (1991). Speech-associated attitudes of stuttering and nonstuttering children. *Journal of Speech and Hearing Research*, *34*, 60–66

Dunn, L. M., & Dunn, L. M. (1997). *Peabody picture vocabulary test*, 3rd ed. Circle Pines, MN: American Guidance Service.

Early, D. M., Iruka, I. U., Ritchie, S., Barbarin, O. A., Winn, D. C., Crawford, G. M., … Pianta, R. C. (2010). How do pre-kindergarteners spend their time? Gender, ethnicity, and income as predictors of experiences in pre-kindergarten classrooms. *Early Childhood Research Quarterly*, *25*, 177–193.

Eccles, J., Wigfield, A., Harold, R. D., & Blumenfeld, P. (1993). Age and gender differences in children's self- and task perceptions during elementary school. *Child Development*, *64*, 830–847.

Eisenberg, N., Fabes, F. A., Shepard, S. A., Murphy, B. C., Guthrie, I. K., Friedman, J., … Maszk, P. (1997). Contemporaneous and longitudinal prediction of children's social functioning from regulation and emotionality. *Child Development*, *68*(4), 642–664.

Epkins, C. C., & Seegan, P. L. (2014). Mother-reported and children's perceived social and academic competence in clinic-referred youth: Unique relations to depression and/or social anxiety and the role of self-perceptions. *Child Psychiatry & Human Development*, *46*(5), 656–670.

Ezrati-Vinacour, R., Platzky, R., & Yairi, E. (2001). The young child's awareness of stuttering-like disfluency. *Journal of Speech, Language, and Hearing Research*, *44*, 368–380.

Festa, C. C., & Ginsburg, G. S. (2011). Parental and peer predictors of social anxiety in youth. *Child Psychiatry & Human Development*, *42*(3), 291–306.

Floyd, R. G., McGrew, K. S., & Evans, J. J. (2008). The relative contributions of the Cattell-Horn-Carroll cognitive abilities in explaining writing achievement during childhood and adolescence. *Psychology in the Schools*, *45*, 132–144.

Fujiki, M., Brinton, B., Morgan, M., & Hart, C. H. (1999). Withdrawn and sociable behavior of children with language impairment. *Language, Speech, and Hearing Services in Schools*, *30*, 183–195.

Gertner, B. L., Rice, M. L., & Hadley, P. A. (1994). Influence of communicative competence on peer preferences in a preschool classroom. *Journal of Speech and Hearing Research*, *37*, 913–923.

Grillis-Taquechei, A., Norton, P., & Ollendick, T. H. (2010). A longitudinal examination of factors predicting anxiety during the transition to middle school. *Anxiety Stress & Coping: An International Journal*, *23*(5), 493–513.

Haller, S. P. W., Cohen Kadosh, K., & Lau, J. Y. F. (2014). A developmental angle to understanding the mechanisms of biased cognitions in social anxiety. *Frontiers in Human Neuroscience*, *7*, 1–5.

Harter, S., & Pike, R. (1984). The pictorial scale of perceived competence and social acceptance for young children? *Child Development*, *55*(6), 1969–1982.

Harter, S. (1990). Developmental differences in the nature of self-representations: Implications for the understanding, assessment, and treatment of maladaptive behavior. *Cognitive Therapy and Research*, *14*(2), 113–142.

Harter, S. (2003). The development of self-representations during childhood and adolescence. In M. R. Leary, & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 610–642).New York: Guilford Press.

Hodson, B. W. (2004). *Hodson assessment of phonological patterns*, 3rd ed. Austin, TX: ProEd

Hresso, W. P., Reid, D. K., & Hammill, D. D. (1999). *Test of early language development*, 3rd ed. Austin, TX: Pro-Ed.

Jambunathan, S., & Hurlbut, N. L. (2000). Gender comparisons in the perception of self-competence among four-year-old children. *The Journal of Genetic Psychology*, *161*(4), 469–477.

Jambunathan, S., & Norris, J. A. (2000). Perception of self-competence in relation to language competence among preschoolers? *Child Study Journal*, *30*(2), 91–101.

Jelicîc', H., Phelps, E., & Lerner, R. M. (2009). Use of missing data methods in longitudinal studies: The persistence of bad practices in developmental psychology. *Developmental Psychology*, *45*(4), 1195–1199.

Jerome, A. C., Fujiki, M., Brinton, B., & James, S. L. (2002). Self-esteem in children with specific language impairment. *Journal of Speech, Language, and Hearing Research*, *45*, 700–714.

Jones, R., Choi, D., Conture, E., & Walden, T. (2014). Temperament emotion, and childhood stuttering. *Seminars in Speech and Language*, *35*(2), 114–131.

Klaver, J. M., Palo, A. D., & DiLalla, L. F. (2014). Inaccuracy of perceived competence ratings is associated with problem behaviors in 5-year-old children. *The Journal of Genetic Psychology*, *175*(5), 363–381.

Klein, S., & Magill-Evans, J. (1998). Perceptions of competence and peer acceptance in young children with motor and learning difficulties. *Physical & Occupational Therapy in Pediatrics*, *18*(3/4), 39–52.

Kochanska, G., Murray, K. T., & Harlan, E. T. (2000). Effortful control in early childhood: Continuity and change, antecedent, and implications for social development. *Developmental Psychology*, *36*, 220–232.

Langevin, M., Packman, A., & Onslow, M. (2009). Peer responses to stuttering in the preschool setting. *American Journal of Speech-Language Pathology*, *18*, 264–276.

Leaper, C. (2000). Gender affiliation, assertion, and the interactive context of parent-child play. *Developmental Psychology*, *36*(3), 381–393.

Mantzicopoulos, P. (2006). Younger children's changing self-concepts: Boys and girls from preschool through second grade? *The Journal of Genetic Psychology*, *167*(3), 289–308.

Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments. *American Psychologist*, *53*(2), 205–220.

McQuade, J. D., Vaughn, A. J., Hoza, B., Murray-Close, D., Molina, B. S. G., Arnold, L. E., & Hechtman, L. (2014). Perceived social acceptance and peer status differentially predict adjustment in youth with and without ADHD? *Journal of Attention Disorders*, *18*(1), 31–43.

Miserandino, M. (1996). Children who do well in school: Individual differences in perceived competence and autonomy in above-average children? *Journal of Educational Psychology*, *88*(2), 203–214.

Moscovitch, D. A. (2009). What is the core fear in social phobia? A new model to facilitate individualized case conceptualization and treatment. *Cognitive Behavioral Practice*, *16*, 123–134.

Murphy, B., Eisenberg, N., Fabes, R. A., Shepard, S., & Guthrie, I. K. (1999). Consistency and change in children's emotionality and regulation: A longitudinal study. *Merrill-Palmer Quarterly*, *45*, 413–444.

Nelson, L. J., Rubin, K. H., & Fox, N. A. (2005). Social withdrawal, observed peer acceptance, and the development of self-perceptions in children ages 4 to 7 years. *Early Childhood Research Quarterly*, *20*(2), 185–200.

Nelson, L. J., Hart, C. H., Evans, C. A., Coplan, R. J., Roper, S. O., & Robinson, C. C. (2009). Behavioral and relational correlates of low self-perceived competence in young children. *Early Childhood Research Quarterly*, *24*, 350–361.

Phillips, D. (1984). The illusion of incompetence among academically competent children. *Child Development*, *55*, 2000–2016.

Putnam, S. P., & Rothbart, M. K. (2006). Development of short and very short forms of the children's behavior questionnaire? *Journal of Personality Assessment*, *87*(1), 102–112.

Raffaelli, M., Crockett, L., & Shen, Y. (2005). Developmental stability and change in self-regulation from childhood to adolescence? *The Journal of Genetic Psychology*, *166*(1), 54–75.

Rothbart, M. K., & Hwang, J. (2005). Temperament and the development of competence and motivation. In A. J. Elliot, & C. S. Dweck (Eds.), *Handbook of competence & motivation* (pp. 167–184).New York: Guilford Press.

Rothbart, M. (2011). *Becoming who we are: Temperament and personality in development*. New York: Guilford Press.

Rubin, K. H., Coplan, R. J., Fox, N. A., & Calkins, S. D. (1995). Emotionality, emotion regulation, and preschoolers' social adaptation. *Development and Psychopathology*, *7*, 49–62

Rubin, D. B. (1976). Inference and missing data. *Biometrika*, *63*(3), 581–592. Ruble, D. N., Martin, C. L., & Berenbaum, S. A. (2006). Gender development, In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: Vol.3. Social, emotional, and personality development* (pp. 858–932).6th ed. Hoboken, NJ: John Wiley & Sons Inc..

Scheiber, C., Reynolds, M. R., Hajovsky, D. B., & Kaufman, A. S. (2015). Gender differences in achievement in a large, nationally representative sample of children and adolescents. *Psychology in the Schools*, *52*(4), 335–348.

Schlomer, G. L., Bauman, S., & Card, N. A. (2010). Best practices for missing data management in counseling psychology. *Journal of Counseling Psychology*, *57*, 1–10.

Shaywitz, B. A., Shaywitz, S. E., Pugh, K. R., Constable, R. T., Skudlarski, P., Fulbright, R. K., … Gore, J. C. (1995). Gender differences in the functional organization of the brain for language. *Nature*, *373*, 607–609.

Stoet, G., & Geary, D. C. (2015). Gender differences in academic achievement are not related to political, economic, or social equality. *Intelligence*, *48*, 137–151.

Strein, W., Simonson, T., & Vail, L. (1999). Convergence of views: Self-perceptions of African American and White kindergartners. *Psychology in the Schools*, *36* (2), 125–134.

Teachman, B. A., & Allen, J. P. (2007). Development of social anxiety: Social interaction predictors of implicit and explicit fear of negative evaluation? *Journal of Abnormal Child Psychology*, *35*(1), 63–78.

Tram, J. M., & Cole, D. A. (2000). Self-perceived competence and the relation between life events and depressive symptoms in adolescence: Mediator or moderator? *Journal of Abnormal Psychology*, *109*(4), 753–760.

Tumanova, V., Conture, E. G., Lambert, E. W., & Walden, T. A. (2014). Speech disfluencies of preschool-age children who do and do not stutter. *Journal of Communication Disorders*, *49*, 25–41.

Uhrlass, D. J., Schofield, C. A., Coles, M. E., & Gibb, B. E. (2009). Self-perceived competence and prospective changes in symptoms of depression and social anxiety? *Journal of Behavior Therapy and Experimental Psychiatry*, *40*(2), 329–337.

Vanryckeghem, M., & Brutten, G. J. (2007). *Communication attitude test for preschool and kindergarten children who stutter (KiddyCAT)*. San Diego, CA: Plural Publishing.

Vanryckeghem, M., Hylebos, C., Brutten, G. J., & Peleman, M. (2001). The relationship between communication attitude and emotion of children who stutter? *Journal of Fluency Disorders*, *26*(1), 1–15.

Vanryckeghem, M., Brutten, G. J., & Hernandez, L. M. (2005). A comparative investigation of the speech-associated attitude of preschool and kindergarten children who do and do not stutter? *Journal of Fluency Disorders*, *30*(4), 307–318.

Verschueren, K., Buyck, P., & Marcoen, A. (2001). Self-representations and socioemotional competence in young children: A three-year longitudinal study. *Developmental Psychology*, *37*, 126–134.

Williams, K. T. (1997). *Expressive vocabulary test*, 2nd ed. Minneapolis, MN: Pearson Assessments.

Wigfield, A., Eccles, J. S., Harold, R. D., Blumenfeld, P., Arbreton, A., Freedman-Doan, C., et al. (1997). Change in children's competence beliefs and subjective task values across the elementary school years: A 3-year study. *Journal of Educational Psychology*, *89*, 451–469.

Wood, A. M., White, I. R., & Royston, P. (2008). How should variable selection be performed with multiply imputed data? *Statistics in Medicine*, *27*, 3227–3246.

Yairi, E., & Ambrose, N. G. (1999). Early childhood stuttering I: Persistency and recovery rates. *Journal of Speech, Language, and Hearing Research*, *42*(5), 1097–1112.

Yairi, E., & Ambrose, N. G. (2005). *Early childhood stuttering: For clinicians by clinicians*. Austin, TX: Pro-Ed.

Zebrowski, P. M. (2007). Treatment factors that influence therapy outcomes of children who stutter, In E. G. Conture, & R. F. Curlee (Eds.), *Stuttering and related disorders of fluency* (pp. 23–38).2nd ed. New York: Thieme Medical Publishers, Inc..